on to public lands (BLM administered lands) and for wildfires spreading from public land to municipal property.

Cooperative efforts on the parts of community officials, private landowners, and the BLM will be required to implement a successful Community-at-Risk Program that will reduce the frequency of wildfires. Therefore, this hazard assessment has been performed to evaluate and identify areas with unusually heavy concentrations of fuels, over-mature and decadent fuels, and other factors that are believed to potentially increase the severity of fire behavior. The assessment area was also analyzed to identify slope, roads, land ownership status, location of homes and subdivisions, available fire suppression infrastructure, and any additional environmental impacts that may be within the assessment area. During this assessment process a public meeting was convened to disseminate information to and obtain information from the general public. The information that was gathered during the assessment is contained within this hazard assessment and mitigation report.

2.0 Bear Lake County-Community Profile

Community Description.
The assessment area includes approximately 35 subdivisions near or abutting BLM and/or Forest Service managed land near the Wasatch-Cache and Caribou-Targhee National Forest. Communities in the county included in the assessment include Fish Haven, Bloomington, Bennington, Geneva, Raymond, Liberty, Ovid, Bern, Bailey Creek, Pegram and Dingle within Bear Lake County (Appendix A: Figure 1).

Population: The total population of Bear Lake County is approximately 6,360 as of 2002 census. In the assessment area are numerous small towns, communities, single home sites, and vacation homes. The largest towns in the assessment area have only 100 to 200 year round residents, but recreational use of the Bear Lake area increases dramatically during the summer months to many thousands of people. Twenty seven subdivisions were examined in this assessment. Population generated by recreational opportunities will continue to grow over the next years. Population projections by Idaho Power are expected to be nearly 8,600 by 2025 while other projections (Woods and Poole) predict much less (6,900) in the same time frame. Woods and Poole prediction although less aggressive is more consistent with school population trends. Much of the population generated by recreational opportunities extends from the neighboring Wasatch Front Metropolitan area of Salt Lake City, Ogden and Provo.

Ownership of land in the assessment area (approximate): Within the assessment area boundary, the land ownership is: US Forest Service (USFS) <1%, BLM 6%, State 2%, US Fish and Wildlife Service (USFWS) 7%, and private 84%. The Wasatch-Cache National Forest (USFS-administered land) trends north/south along the western boundary of the county while the Caribou-Targhee National Forest trends north/south on the eastern side of the county (Appendix A: Figure 4).

Historic and background information: Historically, Bear Lake Valley was considered to be prime hunting ground by the Shoshone, Ute, and Bannock Tribes. Mountain men appeared in the area in 1818 for trapping and hunting. In 1827 and 1828 rendezvous were held to enable trading of fur. In 1836 the Whitman-Spalding party came through the valley and their tales led to the establishment of this portion of the Oregon Trail. In 1863 Brigham Young sent the first settlers to the valley under Charles C. Rich. They established the community of Paris, which was to become the County seat in 1875 when Bear Lake County was established. Capt. Bonneville came through the Bear River Valley and was followed by other notable explorers on the Oregon Trail. Of those notables were Nathaniel Wythe, Jason Lee and the Whitmans and Spaldings, all on their way to the fertile Willamette Valley. Another notable character to grace the region was Thomas L. "Peg-Leg" Smith, who opened a trading post in what is now Dingle, Idaho. Immigrants found the area to their liking settled in local communities such as Geneva, Raymond and Pegram. Timber, minerals and farming supported the valley population until recreation became important with the arrival of the railway and suitable vehicles and roadways.

The Valley is generally southeast of Pocatello 100 miles via US 30 and 89 and north east of Logan 60 miles via US 89. The assessment area includes two valleys, the Bear River Valley and the Thomas Fork Valley which trend north/south and are separated by the Pruess Mountain Range. The major slopes south of Ovid and Liberty face generally toward the east and are divided by various east flowing Drainages (Ovid Creek, Sleight Canyon, Paris Canyon, Bloomington Creek, Dry Creek, Dry Canyon, St. Charles Creek, Fish Haven Canyon) that empty into either Bear Lake or the Bear River dowstream of Bear Lake. Ephemeral streams have carved valleys in the Thomas Fork Valley that trend predominantly east/west from the Pruess Mountain range. The west slope of the range possesses very steep canyon walls with little vegetation while the east slope of the Pruess Mountains, have less steep drainages. Recent geologic activity on the east side of Bear Lake has produced extremely steep scarp faces with accompanying steep east/west drainages. The streams produced from these drainages provide much of the surface water for various irrigation projects and power generation plants locally and down stream along the Bear River. North of State Highway 36 Emigration Creek, North Creek and Poison Hollow flow southward into Ovid Creek while Sheep Hollow, Bear Hollow and Red Pine Hollow flow directly into Bear River creating extensive areas of dry south facing slopes. Other streams in the county include: Indian Creek, Thomas Fork Creek and Bailey Creek, which flow consistently. Thomas Fork Creek drains the Thomas Fork Valley and flows south to converge with the Bear River. Indian Creek flows west to Bear Lake and Bailey Creek flows north to converge with the Bear River. Indian Creek has downcut and exposed significant, dry, south facing slopes. There are many other ephemeral streams, which only fill during the spring to accommodate snow melting off the higher elevations. Elevations in the Bear Lake assessment area range from 5,923 feet to 7,260 feet above mean sea level (amsl). Bear Lake County is bordered by Lincoln County, Wyoming to the east and Rich County, Utah to the south and Caribou County, Idaho to the north. Drainages trending east/west are also very steep in this region and have significant southern exposure.

Until the last decade, farming and grazing controlled the vegetation on the lower slopes with grazing, logging, and water or mineral developments determining much of the vegetation at higher elevations. However, during the last decade recreation and associated housing has expanded causing an increase in fuel loadings as well as an increase in the grass, sagebrush, mountain shrub and conifer stands. With the increasing demand for primary and secondary housing, subdivisions have been developed adding to the ever-increasing number of summer visitors to this area. This has in turn led to an increased risk of human-caused fires when the native vegetation is most susceptible to ignition.

With an ever increasing seasonal demand for domestic water combined with the recent drought conditions over the last few years, water levels in the reservoirs and storage tanks have been dropping creating a high potential for water shortages. New water sources will need to be developed in the near future for some of the subdivisions or growth will be limited.

Date of Assessments: August 28, 2002 to September 17, 2002 (High Risk Areas)
October 14, 2003 through April 15, 2004 (remainder of county)

2.1 Climate summary

The Montpelier Weather Stations' 30-year (1971-2000) averages indicate temperature highs of less than 90°F in late July and August with lows of 50°F for the same time period. Winter 30-year highs were between 20 and 30°F in December and January with lows just above 5°F for the same months. Distribution of precipitation within the county is variable due to the changes in altitude. Valley locations receive approximately 10 inches of water per year while the upper elevations receive 25 inches or more water per year. Precipitation is heaviest during the winter months and comes most years as snow providing sufficient snow to encourage snowmobile operators and cross country skiers to travel the back county. Long-term climate data for the assessment area is shown in Table 1.

Table 1. Long term monthly climate data summary for the Bear Lake area. The period of record is 1/1/1931 to 6/30/1991 (Table 1a). Table 1b shows the data from 1971 to 2002. Climate center located at Montpelier, Idaho.

Table 1a	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	29.5	33.6	40.3	52.9	64.7	74.3	85	83.4	73.1	60.6	42.5	32.4	56
Average Min. Temperature (F)	6.3	8.6	16.1	26.7	34.7	41.3	47.2	45	36.2	27.8	18.4	10.5	26.6
Average Total Precipitation (in.)	1.2	1.15	1.28	1.32	1.42	1.48	0.76	0.91	1.15	1.14	1.09	1.19	14.09
Average Total SnowFall (in.)	13.4	11.8	9.4	3.9	0.8	0.1	0	0	0.2	1.6	7.1	13.3	61.6
Average Snow Depth (in.)	10	12	6	0	0	0	0	0	0	0	1	5	3

Table 1b	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	29.4	34.5	42.1	53	63	74.8	83.8	82.5	72.3	59.4	40.8	31	55.7
Average Min. Temperature (F)	6	8.7	17.8	26.4	34.1	41.3	46.8	44.8	36	27.1	17.4	8.3	26.3
Average Total Precipitation (in.)	1.27	1.28	1.35	1.25	1.73	1.08	0.81	1.12	1.37	1.28	1.43	1.32	15.29

2.2 Geology

The geology of the area consists of alluvial deposits and clay beds with Limestone and Dolomite as the primary bedrock material. Major structural elements are Paleozoic and Mesozoic rock formations of the Bear River Range that have been thrust faulted and strongly folded. Similar bedrock units in the Bear Lake Plateau and Pruess Range have also been thrust faulted, tightly folded and overturned. The Bear Lake Valley appears to be a typical basin and range but rather, is a graben bounded on both sides by active faults. This activity is apparent from fault scarp faces on the east side of Bear Lake and other areas. Water bearing units in the area include the Brigham Formation. Many formations in Bear Lake County do not contain prolific water bearing units.

2.3 Soils

Most soils in the area are lacking in nutrients and organic matter. Mostly mixtures of clay and silt they have little cohesion and are prone to slippage and erosion . Post fire conditions promote slope failure and gully erosion within areas of this soil type.Exceptions to the rule are those soils on or near the Bear Lake National Wildlife Refuge which contain more nutrients and organic matter.

2.4 Wildlife

Wildlife within the assessment are as follows:
Mule deer, rocky mountain elk, moose, sage grouse, ruffed grouse, blue grouse, snowshoe hare, porcupine, bobcat, fox, coyote, Townsend bat, gopher, Bonneville cutthroat trout, rainbow trout, brook trout, amphibians, migratory song birds, raven, crow, magpie, skunk, mountain lion, black bear, rock chuck, badger, woodpeckers, beaver, pine squirrel, ducks, geese, raccoon. The Bear Lake National Wildlife Refuge has reported two species of interest, the bald eagle and the trumpeter swan. The bald eagle has been listed as a threatened and/or endangered species but preservation has solicited removal from the list. Trumpeter swans have generated interest through potential listing but have not yet received that designation. Other species of interest include the Gray wolf and Utah valvata snail. Other species of interest to the State of Idaho within the assessment area include:

Mammals

Coast mole (*Scapanus orarius*),Fringed myotis (*Myotis thysanodes*), Western pipistrelle (*Pipistrellus hesperus*), Spotted bat (*Euderma maculatum*), Townsend's big-eared bat (*Corynorhinus townsedii*), Pygmy rabbit (*Brachylagus idahoensis*),
Cliff chipmunk (*Tamias dorsalis*), Uinta chipmunk (*Tamias umbinus*), Rock Squirrel (*Spermophilus variegatus*), Little pocket mouse (*Pergnathus longimembris*), Dark kangaroo mouse (*Microdipodops megacephalus*), Northern bog lemming (*Synaptomys borialis*), Kit Fox (*Vulpes macrotis*), Fisher (*Martes pennanti*), Wolverine (*Gulo gulo*), California bighorn sheep (*ovis canadensis californiana*)

Birds

Common loon (*Gavia immer*), american white pelican (*Pelecanus erythrorhynchos),* great egret (*Ardea alba*), trumpeter swan (*cygnus buccinator*), harlequin duck (*Histrionicus histrionicus*), northern goshawk (*Accipiter gentilis*), columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*), greater sage grouse (*Centrocercus urophasianus*), mountain quail (*Oreortyx pictus*), black tern (*Chlidonias niger*), Upland sandpiper (*Bartramia longicauda*), flammulated owl (*Otus flammeolus*), northern pygmy-owl (*Glaucidium gnoma*), great gray owl (*Strix nebulosa*), boreal owl (*Aegolius funereus*), white-headed woodpecker (*Picoides albolarvatus*), three-toed woodpecker (*Picoides tridactylus*), black-backed woodpecker (*Picoides arcticus*), pygmy nuthatch (*Sitta pygmaea*), loggerhead shrike (*Lanius ludovicianus*).

Fish

Bear Lake sculpin (*Cottus extensus*), shoshone sculpin (*Cottus greenei*), wood river sculpin (*Cottus leiopomus*), white sturgeon (*Snake and Salmon Rivers*) (*Acipenser transmontanus*), yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*), westslope cutthroat trout (*Oncorhynchus clarki lewisi*), Snake River finespotted cutthroat trout (*Oncorhynchus clarki spp.),* Bear Lake cutthroat trout (*Oncorhynchus clarki spp*.), interior redband trout (*Oncorhynchus mykiss gairdneri*), Bear Lake whitefish (*Prosopium abyssicola*), bonneville cisco (*Prosopium gemmifer*), bonneville whitefish (*Prosopium spilonotus*), leatherside chub (*Gila copei*), sand roller (*Percopsis transmontana*).

Amphibians and Reptiles

Coeur d=Alene salamander (*Plethodon idahoensis*), western toad (*Bufo boreas*), columbia spotted frog-northern population (*Rana pretiosa*), northern leopard frog (*Rana pipiens*), mojave black-collared lizard (*Crotaphytus bicinctores*), ringneck snake (*Diadophis punctatus*), Longnose snake (*Rhinocheilus lecontei*), ground snake (*Sonora semiannulata*).

Invertebrates

Idaho dunes tiger beetle (*Cicindela arenicola*), Columbia River tiger beetle (*Cicindela columbica*), bruneau dunes tiger beetle (*Cicindela waynei*), blind cave leiodid beetle (*Glacicavicola bathyscioides*), Idaho point-headed grasshopper (*Acrolophitus pulchellus*), california floater (*Anodonta californiensis*), marbled disc (*Discus marmorensis*), mission creek oregonian (*Cryptomastix magnidentata*), costate mountainsnail (*Oreohelix idahoensis idahoensis*), boulder pile mountainsnail (*Oreohelix jugalis*), striate mountainsnail (*Oreohelix strigosa goniogyra*), whorled mountainsnail (*Oreohelix vortex*), lava rock mountainsnail (*Oreohelix waltoni*), columbia pebblesnail (*Fluminicola fuscus*), shortface lanx (*Fisherola nuttalli*).

Plants

Slickspot peppergrass (*Lepidium papilliferum*), packard=s milkvetch (*Astragalus cusickii var. packardiae*), indian valley sedge (*Carex aboriginum*), centennial rabbitbrush (*Chrysothamnus parryi ssp. montanus*), membrane-leaved monkeyflower (*Mimulus hymenophyllus*), spacious monkeyflower (*Minulus ampliatus),* obscure phacelia (*Phacelia inconspicua*), clearwater phlox (*Phlox idahonis*), salmon twin bladderpod (*Physaria didymocarpa var. lyrata*), bienneial princesplume (*Stanleya confertiflora*), meadow pussytoes (*Antennaria arcuata*), jessica=s aster (*Aster jessicae*), goose creek milkvetch (*Astragalus anserinus*), meadow milkvetch (*Astragalus diversifolius*), mulford=s milkvetch (*Astragalus mulfordiae*), white clouds milkvetch (*Astragalus vexilliflexus var. nubilus*), peculiar moonwort (*Botrychium paradoxum*), Idaho sedge (*Carex parryana ssp. Idahoa*), flexible alpine collomia (*Collomia debilis var. camporum*), Idaho hawksbeard (*Crepis bakeri ssp idahoensis*), greeley=s wavewing (*Cymopterus acaulis var. greeleyorum),* Idaho douglasia (*Douglasia idahoensis*), stanley

whitlow-grass (*Draba trichocarpa*), welsh=s buckwheat (*Eriogonum capistratum var. welshii)*, guardian buckwheat (*Eriogonum meledonum*), packard=s buckwheat (*Eriogonum shockleyi var. packardiae*), palouse goldenweed (*Haplopappus liatriformis*), bruneau river prickly phylox (*Leptodactylon glabrum*), hazel=s prickly phlox (*Leptodactylon pungens ssp. Hazeliae*), packard=s desert-parsley (*Lomatium packardiae*), smooth stickleaf (*Mentzelia mollis*), rydberg=s musineon (*Musineon lineare*), cache penstemon (*Penstemon compactus*), Idaho penstemon (*Penstemon idahoensis*), alkali primrose (*Primula alcalina*), bartonberry (*Rubus bartonianus)*, tobias= saxifrage (*Saxifraga bryophora var. tobiasiae*).

2.5 Vegetation

Within the assessment area, Bear Lake County has a wide range of vegetation types depending upon topography and aspect. Lowland valley areas are typically wet and have the greatest diversity of vegetation. The Bear Lake National Wildlife Refuge is located in the center of the Bear Lake Valley. This refuge is managed to maintain and enhance diversity among plants and animals. Within the wildlife refuge there are over 150 different species of plants. Outside the wildlife refuge plant communities on the upland and hillsides are typical of a high altitude prairie and consist of brush and grass communities. Upper elevations and slopes facing north and west are predominantly covered with large woody species. Species commonly found within the assessment include but are not limited to:
Sagebrush, bitterbrush, grasses, tall forbs, snowberry, rabbitbrush, snowbrush, huckleberry, buffalo berry, twin berry, willow, mountain mahogany, choke cherry, hawthorn, service berry, juniper, bigtooth maple and cottonwood are typically found in the valley and hillside locations. Trees such as aspen, Douglas-fir, lodgepole pine, Engelmann spruce, subalpine fir, limber pine,

2.6 Emergency Services

Law enforcement is provided through Bear Lake County and Montpelier, Paris, and Georgetown Cities. Ambulance services are located in Montpelier City. Fire protection is provided by a volunteer fire department with volunteers located throughout the county as well as strategically placed equipment to enhance quick response. Agreements have been made with local fire departments from Garden City, Utah and Soda Springs, Idaho to reduce response time in outlying areas of the county that are closer to other jurisdictions as well as for backup in severe situations. Other agencies such as the U.S. Forest Service, Bureau of Land Management and State Department of Lands also assist fire fighting efforts within the county.

2.7 Transportation

Bear Lake County encompasses an area of roughly 628,000 acres with few roads. Timing location, and expansion of transportation networks are important issues affecting future access.

There are only two major routes in the County, U.S. Highway 89 and 30. Both are used extensively by tractor trailers for transport of goods across state lines. State Highway 36 connects Preston to U.S. 89 by way of Emmigration Canyon. Both US 89 and 30 are also part of the scenic byway system and transport tourists and travelers year round to destinations such as Jackson Hole, Wyoming and Yellowstone National Park. Both of these highways are maintained by the Idaho Department of Transportation and are 2 lane roads with intermittent additional passing lanes.

Bear Lake County Road and Bridge Department is responsible for maintenance and construction of 70 miles of paved road and 500 miles of gravel road. Most roads in the county are a crushed material base with seasonal application of Magnesium Chloride as dust abatement. Paved roads in the county are single lane with minimal shoulder at some locations.

Located ten miles outside Paris, Idaho the Bear Lake County Airport was originally constructed for the military during World War II. Presently, it has two runways in use. The primary runway is asphalt and 5,730 feet in length and 75 feet wide and essentially level. This runway was resurfaced during 2003. The second runway is 4,590 feet long and 150 feet in width and unimproved since 1942. Significant weed growth and cracking are prevalent along the entire length of this runway. Both runways are provided with a paved turnaround area. A lighted windsock is located on the north end of the primary runway. Presently, precision and non-precision instrument approach are not available for either runway. The primary runway has a single wheel loading (SWL) of 12,500 pounds while the secondary runway has strength rating of 50,000 SWL, 64,000 pounds Dual Wheel Loading (DWL), and 102,000 pounds Dual Tandem Wheel Loading (DTWL).

2.71 USDA-Forest Service Roads

The USDA-Forest Service, Wasatch-Cache and Caribou-Targhee National Forest has built and maintained numerous two-lane gravel roads throughout the county for recreation, logging and mining. Some of these have been closed and many are currently gated with access allowed for seasonal use or during a wildfire. The Caribou-Targhee National Forest has recommendations and requirements for these roads, and a travel plan with requirements for the trail system and off road or trail travel is being developed.

2.8 Weed Control

Undesirable vegetation plays a primary role in wildland fires and must be addressed in fire prevention plans. Labeled as weeds, these plants are non-native, invasive and

difficult to control. Due to their deleterious nature, some have been given the legal designation of "Noxious" by the state of Idaho and under the law require management. Many others are problematic and especially troublesome to fire managers.

Fire and fuels management is complicated. In short, undesirable vegetation (weeds) can provide the fuel to an unwanted fire, increase its speed and intensity and increase costs of wildfire prevention and management. Of primary concern are the annual vegetation types which grow, mature and become an abundant dry fuel source in one short growing season. As these types establish, increases in the fire frequency go up drastically.

Cheat grass is the prime example. Downey brome (cheatgrass), an annual plant has established itself in much of the western states and resulted in more fires and higher fire management costs. Cheatgrass is an alien species which can displace the native perennial grasses which burn with less frequency. It is wide spread over the western states and control measures are extremely costly or ineffective. Other similar invading annual grasses have also become abundant in parts of western rangelands.

Current Conditions and Risk Assesment

In brief, Bear Lake County is at risk of being invaded by unwanted weeds and annual grasses. At present cheatgrass can be found throughout the county. In some areas it is quite abundant. Although cheatgrass is abundant it may not yet be the dominating vegetation type in most plant communities in this area. Its effects on fire frequency have not been as pronounced. Other invasive species need to be watched as well.
Increased potential of undesirable vegetation can be associated with the following types of activities.

- Major construction projects such as pipelines and roads.
- Housing projects in undeveloped areas.
- Crops or seeding projects that fail.
- Improper grazing practices, especially on drought stressed ranges.
- Farming which does not incorporate aggressive weed control practices.
- Noxious weed control practices which leave a site void of desirable vegetation.

Any activity, that creates an area of soil void of vegetation, will likely result in weeds and a change in traditional fire regime.

Summary

Fire on western lands is a natural phenomenon. However, due to the recent encroachment of weeds on these lands, fire frequencies have been elevated to an unprecedented level. This is a concern for the safety and welfare of society and welfare of the natural environment. As landowners and managers maintain native plant communities and restore disturbed ones to a desirable state, fire frequencies will be kept at more manageable level.